

March 2022

RNP Instrument Approach Procedures at Sherburn-in- Elmet aerodrome

*Description of Airspace Change Proposal
For ACP-2015-04*

March 2022 version



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March 2022 Updates

Sherburn Aero Club is issuing a further update to the ACP document.

This is to clarify the anticipated utilisation rate of the IAP post publication and to confirm that SAC believe that the level of engagement conducted with relevant stakeholders is still proportionate and appropriate for the level of impact associated with the IAP's introduction.

November 2021 Updates

Further to Sherburn Aero Club's September 2021 submission, the CAA requested clarification of several details of the proposal. This resulted in some updates on the September 2021 submission which are highlighted by change bars throughout. A summary of the CAA questions and associated answers and/or document updates are in Appendix 3.

SAC held meetings with their CAA case officer on 19th October and 4th November 2021 to discuss these clarifications and how to best reflect them in an updated document.

1 September 2021 Submission

Sherburn Aero Club (SAC) are submitting an updated proposal to the CAA for the introduction of RNP instrument approach procedures to runways 28 and 10. There are no major changes to the proposal from previous versions submitted in 2019, however some minor changes have been made to the layout of the procedures.

These changes have been driven by technical design feedback from the CAA, feedback from local stakeholders and some refinement of how aircraft can most effectively navigate the local airspace environment.

1.1 Runway 28 procedure

The southern initial approach fix, previously known as 'RUDUD', has been replaced with a joining location further south of the aerodrome and west of the Doncaster CTA – designated 'IAWP2'. This was felt to be a more optimal location for aircraft to join the procedure since it ensures aircraft are on a defined track towards the next waypoint ('CJS01') before transiting underneath the lower areas of the Doncaster CTA, the base of which is 2000 ft.

Under the original arrangement, aircraft would have been responsible for their own navigation to 'RUDUD' to join the IAP, potentially while transiting underneath or through the various layers of the Doncaster CTA. This would inevitably have resulted in a spread of aircraft tracks underneath the Doncaster CTA, potentially raising the infringement risk.

By moving the initial join away from the lower area of the CTA, this was thought to reduce the risk of infringement of controlled airspace while joining the IAP. Under the new layout, aircraft will still have to transit a short period under the Doncaster CTA base of 2000 ft, however this will be after having joined the procedure. At this point aircraft will be on a defined track, with the vertical limitation of 1900 ft to remain below the CTA clearly indicated on the approach chart.

The original northern initial approach fix has been removed due to local aviation stakeholder feedback that it was too close to Brighton (see also para 7.4, p19). There is now an initial fix on the extended centreline (IAWP1), which is intended to be used by aircraft arriving from the north or east. See p9-13 for more details on the updated RW28 design.

1.2 Runway 10 procedure

The main refinement is the missed approach path, it is now fully charted back to the 'EMBIT' initial approach fix, this is to ensure aircraft are delivered to a terrain safe location on termination of the missed approach (2900 ft AMSL at point 'EMBIT'). See p14-17 for more details of the RW10 design.

1.3 Further Engagement

Between 25th August and 16th September 2021 SAC engaged with local airspace stakeholders on the most recent changes (see section 7, p19-21 for more detail) to ensure impacts were understood. Having concluded this engagement SAC are now confident that the proposals presented are final and represent the most optimal arrangements for implementing the IAP.

1.4 Environmental Assessment – CAP 1616 Part 1c

Sherburn's initial application for an RNP IAP predates the publication of the CAA's CAP1616 in December 2017, covering the current airspace change process. The application therefore continues to progress under CAP 725. However, the current CAP 1616 document addresses airspace changes for an IAP without approach control in Part 1c. SAC have followed the principles and requirements of CAP 1616 Part 1c as far as practical when compiling this latest submission.

Specifically, SAC believes that the proposal meets the criteria specified at Part 1c, paragraph 356, that additional environmental assessment will not be necessary if:

- the change sponsor can reasonably demonstrate that the introduction of the RNP IAP is not expected to increase the total number of aircraft movements at the aerodrome in the first two years after introduction, by 10% or more (by at least a minimum of 3,650 movements per year);
- the proposal does not change the final approach path of aircraft to the runway within 1nm from the runway end; and
- the proposal will not change the environmental impact of aircraft utilising other aerodromes.

The IAP does not change the final approach track within 1 NM of the runways – it is aligned with the existing approach track used in visual conditions and with an approach path angle of 3.5°, is similar to that used under visual conditions.

There is no reason to believe the proposal will change the environmental impact of aircraft utilising other aerodromes.

The table on the next page gives estimated movement data, as will be impacted by the introduction of the IAP. Given the forecast utilisation, SAC is confident that the movement criteria of CAP1616, para 356, will be met.

Sherburn Movement Forecast

v1.3

Date range	Notes	Total movements PA	VFR Movements PA	Forecast Actual RNP PA	Forecast VFR Training PA	Total Movements RNP	*4 % Additional RNP Movements per day	Average RNP per Day
2021	*1	29000	29000					
2022 2023	*2	34000		108	576	684	1.4	1.9
2023 2024	*3	35000		150	576	726	1.5	2.0
*1	2021 movements were curtailed due Covid restrictions, we would have expected 34,400 movements							
*2	RNP Approval assumed half way through 2022							
*3	Growth at sherburn will be limited due to existing saturation of resources, size of fleet, weather conditions, & anticipated economic conditions							
*4	The increase in movements does not include an existing 200 annual IMC Training Movements that currently take place under VFR, since these would operate regardless of the introduction of the RNP							
NOTES	An RNP Movement is an approach using one of the IAP's 20% of days are RNP active days (cloud base below 1200ft) Average RNP movements on RNP days 1.5 Average RNP movements on VFR days 2.0							

2 Proposal Summary

Sherburn Aero Club (SAC) first assessed the viability of introducing Instrument Approach Procedures (IAPs) at Sherburn aerodrome in the summer of 2014. Since 2016 SAC have been progressing an application with the CAA for the introduction of RNP (Required Navigation Performance) IAPs to Runways 28 and 10.

IAPs provide a planned sequence of waypoints and a descent profile to a runway, such that a safe landing can be made in reduced visibility. Historically Sherburn has lacked any form of IAP, meaning aircraft are reliant on visual references only for landing. However, improvements in technology and regulatory provision meant that by 2016 it was viable for SAC to consider applying to the UK CAA for approval of an IAP to the aerodrome.

The IAPs are intended to provide increased safety and operational resilience during periods of poor weather and are consistent with wider Government policy to support the introduction of more RNP IAPs at GA aerodromes and support the ongoing viability of GA aerodromes.

The application to the CAA is made in accordance with the CAP 725 Airspace Change Process. Focused engagement with local stakeholders was conducted in 2017 and 2018 and discussion around operational implementation has continued since then.

The primary purpose of introducing the IAPs is to provide a more reliable means of arriving at the aerodrome during reduced visibility. The IAP will also be used for training purposes, this will be under VFR with a qualified safety pilot/instructor approved by the SAC flight training organisation. This training is essential to ensure that pilots are competent to fly the IAP.

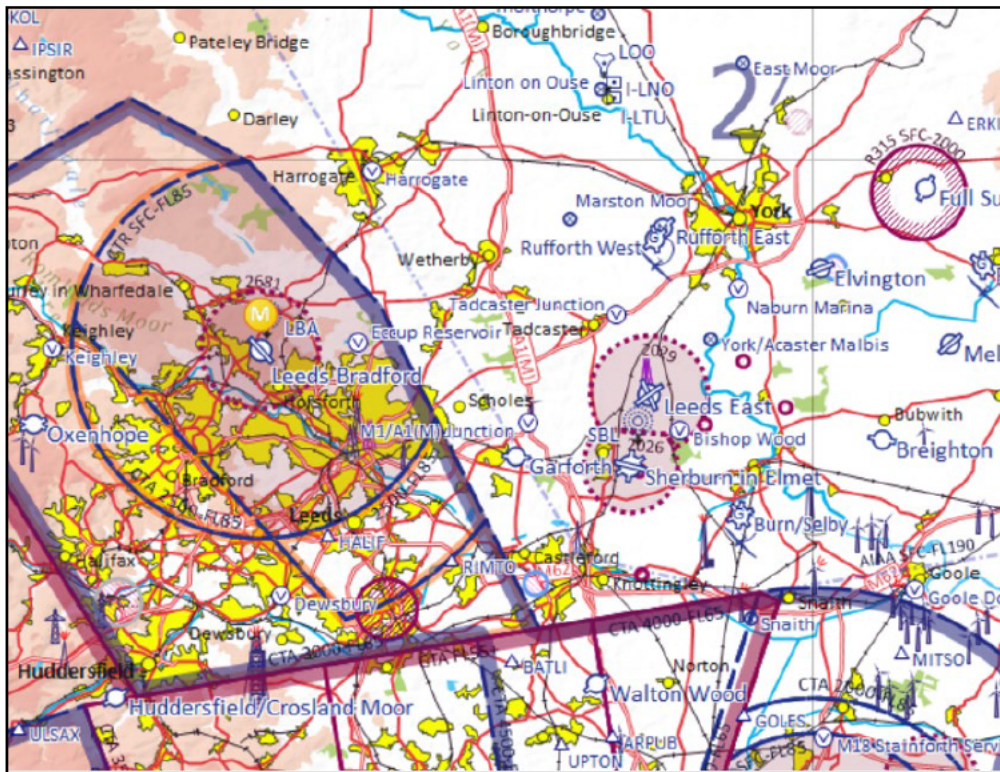
Both IFR use of the IAP and training under VFR will require prior permission from SAC and an allotted slot time. An allocated slot is an hour in duration. Since there is an overlap of the IAP tracks with those proposed at Leeds East, an approach slot booked at one aerodrome precludes and approach being booked at the other. Slots will be allocated on a first come, first served basis.

The procedures would align aircraft for approximately eight nautical miles (NM) with either runway 10 or runway 28 (the runway that aligns roughly East-West) for landing. Aircraft would follow a progressive descent profile of around 360 feet per nautical mile.

3 Background

SAC is a private members club. It operates Sherburn-in-Elmet, a general aviation (GA) aerodrome situated in North Yorkshire. The field is 16 NM southeast of Leeds Bradford Airport, and 20 NM northwest of Doncaster Sheffield Airport. It is situated in Class G airspace. The aerodrome has an air/ground communications service (AGCS) which passes information to aircraft operating at Sherburn and in the immediate vicinity.

The ATZ associated with Leeds East Airport (LEA) is immediately to the north of Sherburn. The proximity of the two aerodromes required a letter of agreement (LoA) to agree procedures for deconfliction of visual traffic operating at either location. This was produced in 2016 and has proved effective.



Sherburn has three runway orientations. The most used runway is the hard surface runway that is aligned 28/10 (roughly east/west). It is to both ends of this runway that the IAPs are to be established.



Sherburn aerodrome summer 2016

The aircraft and operations are characterised by the following:

- Light two or four seat models of around one and a half tonnes maximum take-off weight (MTOW). The largest based aircraft is four tonnes;
- Visual flight rules (VFR) flights. Although some occasional IFR traffic arrives from either the airways or from outside of controlled airspace, before obtaining visual references for landing; and
- Recreational and flight training, with occasional business use.

SAC itself operates a fleet of ten aircraft light aircraft consisting of Piper PA28s, Robin 2160 and Aero AT-3 aircraft. These are used for private hire by members and training towards the private pilot licence (PPL) and associated qualifications. There is also a separate flying school based at Sherburn, Advanced Flight Training, which specialises in more advanced flying courses.

The level of flying activity at the aerodrome has been relatively consistent and has recovered considerably since the lifting of Covid-19 related restrictions. SAC's membership and financial position is stable.

4 Justification and objectives

SAC's motivation for introducing the procedures include:

- In the absence of a published IAP, IFR operations into Sherburn are vulnerable to disruption by weather conditions (sometimes difficult to predict);
- Changes in technology have now made published IAPs a possibility for aerodromes like Sherburn, since the costs have been brought down to more manageable levels;
- There was European funding available for aerodromes wishing to publish IAPs to LPV minima (which make use of the European EGNOS service¹) from the European GNSS Agency (GSA). This money was targeted at environments where conventional approach technology (ILS, VOR, NDB) was not viable; and
- Regulatory provision from the UK CAA in the form of CAP 1122 meant that an alternative (and more cost effective) means of regulatory approval was possible.

It was agreed within SAC that there would be operational advantages to having an RNP approach and introducing them (compared to 'doing nothing') was essentially a matter of reducing the cost to a level that SAC could afford. A small grant in 2015 from the GSA facilitated this.

Runway 10/28 (tarmac) was chosen since it is the longest runway at Sherburn and gives the maximum operational benefit of the procedure. It was briefly considered whether an IAP to runways 06/24 might have some advantages, such as being parallel to the approach track for the nearby Leeds East airport, however it was discounted since this runway is shorter, grass surfaced, has no lighting and is less frequently aligned with the prevailing wind. An IAP to RW

¹ EGNOS is the European Geostationary Navigation Overlay Service, it essentially augments the accuracy of a standard GPS signal, allowing it be used for more applications that require high degrees of positional accuracy in three dimensions. Note EGNOS is no longer available in the UK.

06/24 that terminated in a 'circle to land' procedure to 28/10 was not considered desirable and would likely have high weather minima and therefore lower operational utility.

It is not the intention of SAC to change the core (VFR) flying activities currently taking place. The IAP would be there to provide operational resilience and safety to the limited recreational and business users of the aerodrome who sometimes operate under IFR in and out of the aerodrome, often to destinations outside the UK.

There will also be training for pilots to fly the IAP in VFR with an SAC approved safety pilot/instructor. Currently SAC operates flights that involve training pilots for flight under Instrument Flight Rules, normally operating under VFR with an approved instructor providing the training and look out. We do not anticipate a significant increase in overall traffic of this type, although such flights may now use the IAP when previously they may have recovered visually to the aerodrome.

All use of the IAP for training purposes will require a slot allocation and time as per use of the IAP under IFR in poor weather. SAC does not believe there to be any additional significant risk associated with conducting training flights on the IAP under VFR.

5 Description of Airspace Change

The IAPs to runways 10 and 28 will be standard RNP procedures with 2D (LNAV) minima.

The IAPs will have obstacle clearance heights (OCH) of around 500 ft AGL (above ground level) and be limited to category A & B approach speeds. This means a maximum runway threshold speed of 120 kts. The approach path angle will be 3.5° for both runways, giving a descent profile of around 360 ft per mile.

There is no controlled airspace or change of airspace classification associated with this proposal. The IAPs will be established in class G airspace and follow the normal conventions for the design and publication of RNP procedures. There are no plans to introduce holding procedures; mainly due to the low intensity utilisation of the procedure making it very unlikely (and unintended) that aircraft would need to hold for either arrival sequencing or weather conditions.

Prior to publication the IAPs will be approved by the Civil Aviation Authority in accordance with:

- CAA CAP 725 – *Guidance on the Application of the Airspace Change Process*;
- ICAO PANS-OPS– *Construction of Visual and Instrument Flight Procedures*; and
- CAA CAP 785 – *Approval Requirements for Instrument Flight Procedures for Use in UK Airspace*.

Runways 10 and 28 do not meet the instrument runway obstacle clearance standards and there will not be an approach control service provided for aircraft flying the IAPs. Sherburn therefore applied to the CAA in 2016 to be approved in accordance with CAP 1122 – *Application for instrument approach procedures to aerodromes without an instrument runway and/or approach control*. CAP 1122 has since been withdrawn for new applicants, however Sherburn continues to use the framework set out in CAP 1122, since it provides guidance on safety

procedures and mitigations required to ensure the IAPs can be operated to an acceptable level of safety.

The operational concept is that the procedure is primarily for use when required due to the weather. When conditions permit, aircraft shall join under normal visual joining procedures prior to entering the ATZ. When training flights take place involving the use of the IAP, this will be under VFR with the SAC approved instructor/safety pilot being responsible for look out.

As part of the safety management procedures the utilisation rate of the IAP will be kept no more than one approach per hour.

5.1 Runway 28 procedure rationale

The IAP incorporates a 9.5 NM final approach track from the Intermediate Fix to the runway. Originally there was an initial approach leg from the north, but this was removed due to the proximity of Brighton aerodrome. The missed approach path turns to the south, optimised for clearance of obstacles, local villages, and congested areas. Use of the missed approach path is envisaged to be very limited since most approaches result in a landing rather than the execution of a missed approach procedure.

For aircraft arriving from the south, it was important to provide an initial approach fix that was accessible while remaining clear of controlled airspace. Originally there was an IAF at point now designated 'CJE01', but it was felt this presented an infringement risk since aircraft may not descend in time to remain below the Doncaster CTA5. Instead, an IAF has now been established at IAWP2, which will start aircraft on the procedure with the following waypoint (CSJ01) indicating to cross at 1900 ft, which is below the CTA.

The possibility of the joining altitude being within the CTA (for example at 2500 ft) was considered, but after discussion with Doncaster ATC it was felt too complex to integrate this arrangement into Doncaster's airspace.

The location of the glider site at Burn, close to the final approach fix, has been addressed in the safety case. It was not possible due to PANS-OPS constraints to move the final approach track any further away (for example to the north) from Burn.

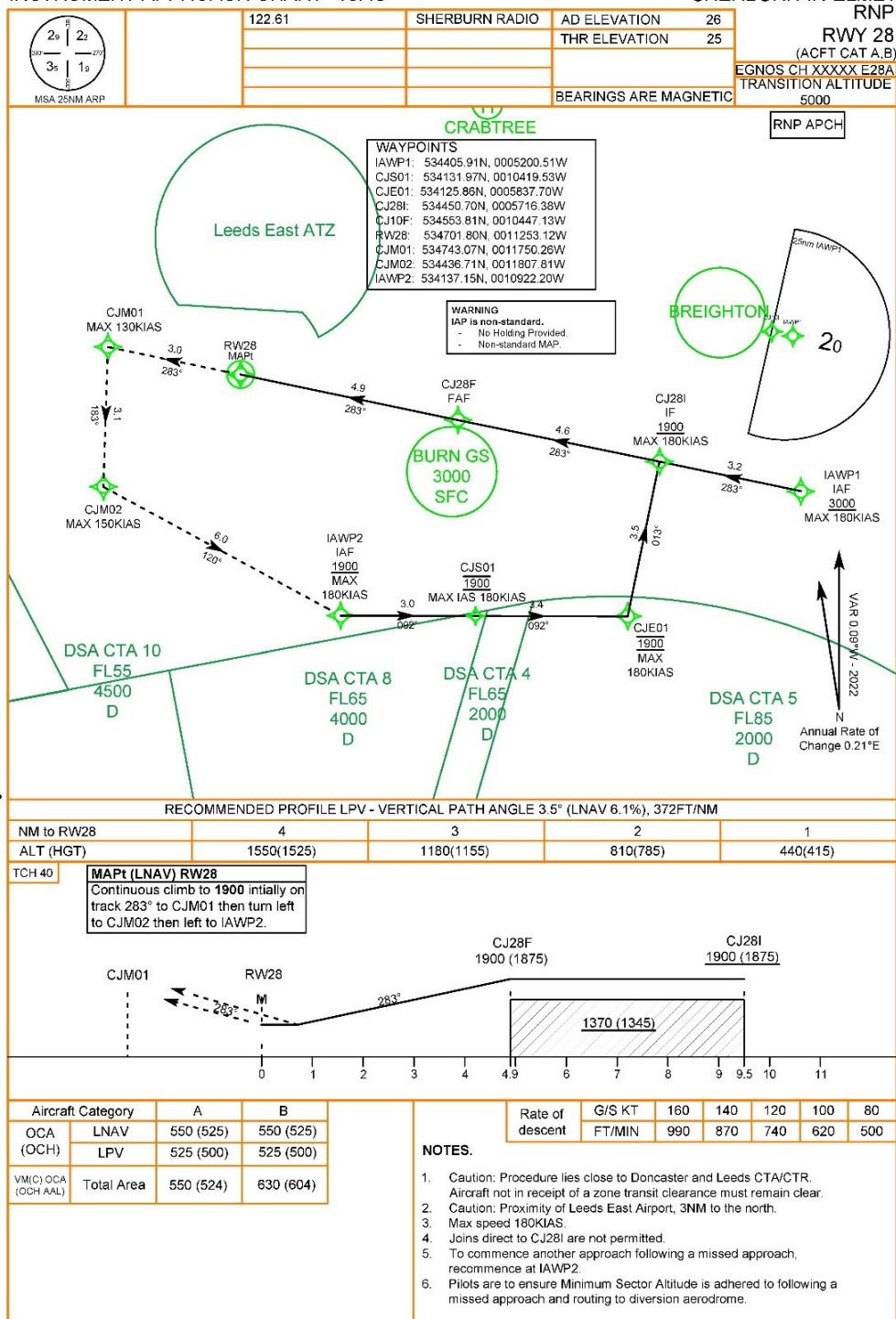
The missed approach procedure returns aircraft to 1900 ft at IAWP2, from which point they can either execute another approach or exit the procedure at the southeast sector MSA of 1900 ft. Due to the proximity of IAWP2 to the higher MSA within the southwest sector (3500 ft), a note is included on the chart to emphasise that pilots must adhere to the applicable MSA if planning to divert away from Sherburn on completion of the missed approach.

5.2 Runway 28 – draft instrument approach chart

DRAFT - NOT FOR OPERATIONAL USE

INSTRUMENT APPROACH CHART - ICAO

SHERBURN-IN-ELMET
RNP



Osprey CSL

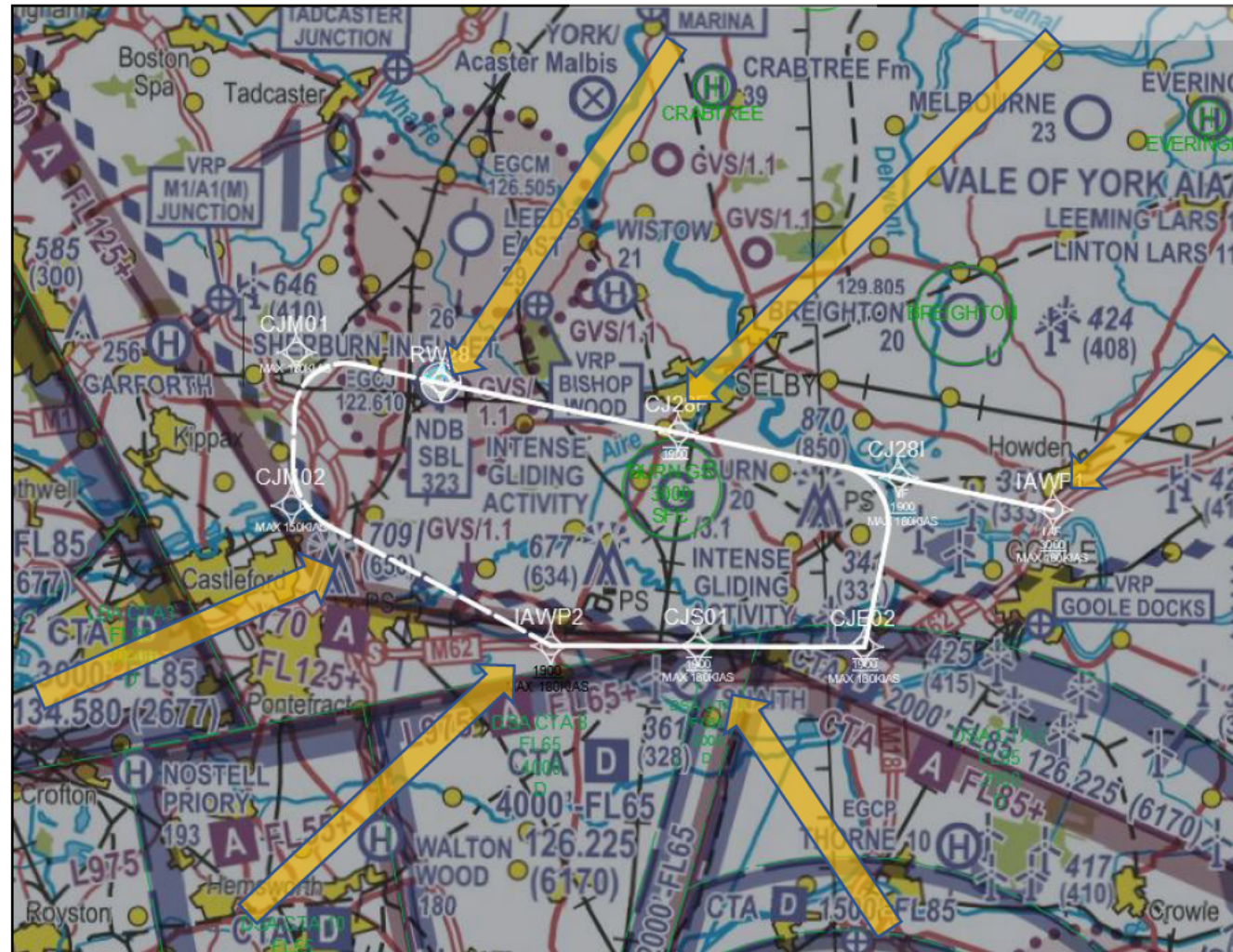
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DRAFT - NOT FOR OPERATIONAL USE

5.3 VFR chart 1:500,000 scale view Runway 28 approach

Runway 28

Final approach fix at altitude 1900 ft



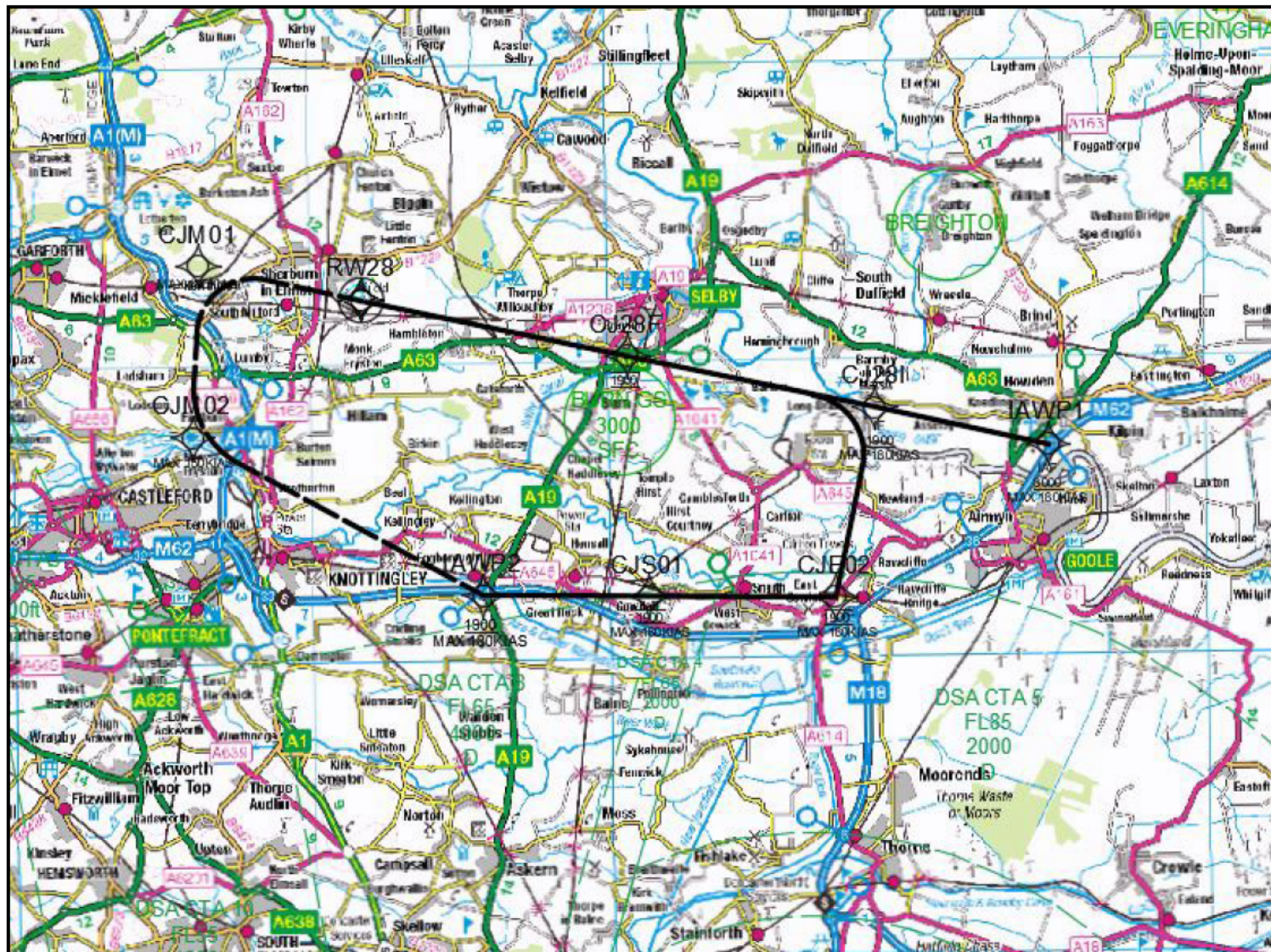
Missed approach path (dashed line) is largely unchanged from earlier proposal, however it now terminates at the southern joining fix.

Northern joining point (Initial Approach Fix) now on the extended centerline. Altitude 3000 ft or above.

Southern joining point (Initial Approach Fix) Aircraft joining from the south will now join at this point and make a right turn to join the approach. Altitude 1900 ft or above.

Aircraft transitioning to the final approach will fly via this **intermediate point**, below the CTA (controlled airspace at Doncaster airport). Aircraft must descend to 1900 ft and cross this point at 1900 ft, unless cleared to transit higher by Doncaster ATC.

5.4 Ordinance Survey view Runway 28 approach



5.5 Runway 10 procedure Rationale

The IAP incorporates a 7 NM final approach track from Intermediate Fix to the runway. Joining is via either the northern (EMBIT) or southern (ULPUG) IAFs.

Leeds Bradford's controlled airspace to the west of the aerodrome is a restricting factor. Initially a calculated TAA of 3000 ft meant aircraft routing from the south and southwest towards the southern IAF would need to transit controlled airspace. A revised TAA to allow a join below controlled airspace was subsequently calculated. The northern IAF is clear of airspace and minimises environmental impact on local villages.

Terminal Arrival Altitude limitations prevent joins at the intermediate fix (CJ10I), so this will be noted on the chart as being prohibited. A central IAF prior to the IF would have been over the congested area of Leeds and well inside Leeds CTR, so this was discounted. All aircraft therefore must start the procedure at either the northern or southern IAF. The inbound legs from the IAFs are set at 3.5 NM, considered acceptable for the types of aircraft intended to use the procedure.

To avoid Leeds East, the missed approach path turns to the south initially before returning to the northern IAF via EMBIT. The rationale for terminating the missed approach at EMBIT is that it delivers the aircraft back to the northwest sector MSA of 2900 ft, should an aircraft wish to resume enroute flight after executing a missed approach. Use of the missed approach path is envisaged to be very limited since most approaches result in a landing rather than the execution of a missed approach procedure.

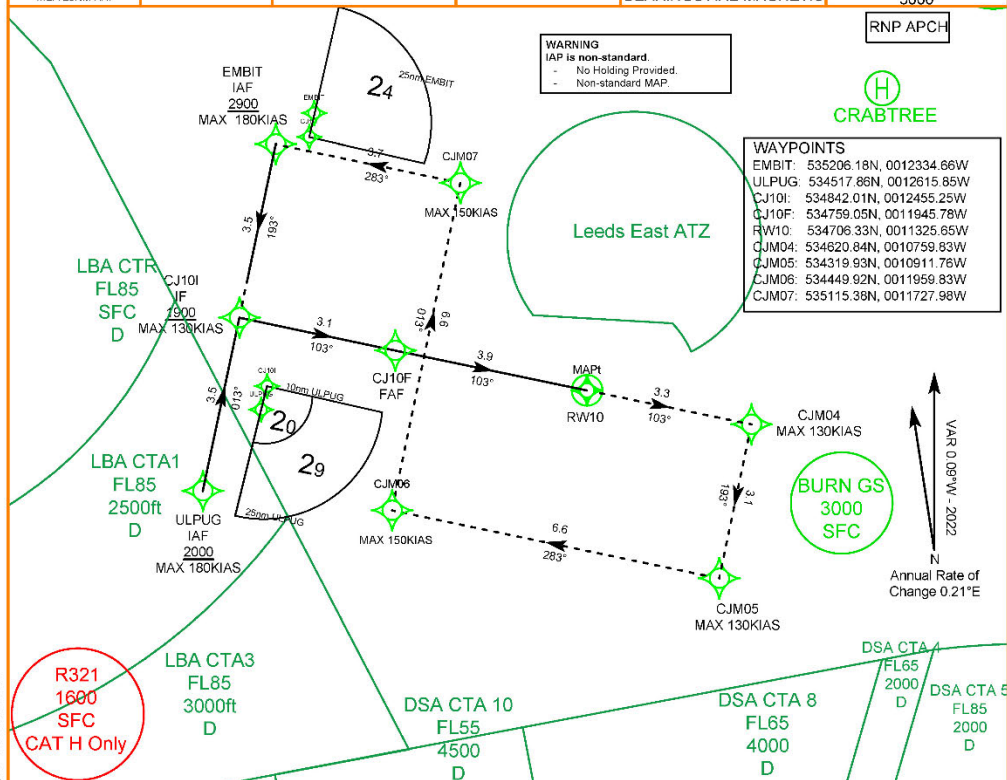
5.6 Runway 10 – draft Instrument approach chart

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INSTRUMENT APPROACH CHART - ICAO

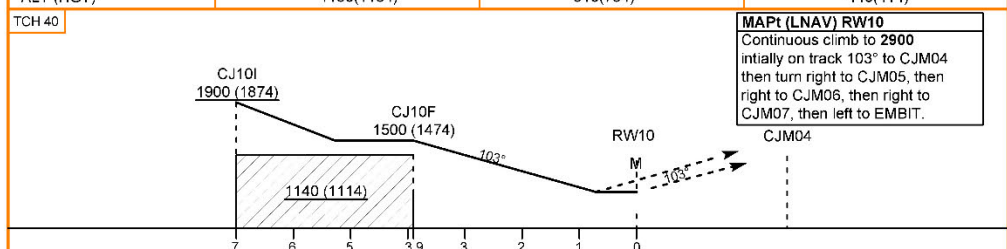
SHERBURN-IN-ELMET

 MSA 25NM ARP	122.61	SHERBURN RADIO	AD ELEVATION 26	RNP RWY 10 (ACFT CAT A,B) EGNOS CH XXXXX E10A TRANSITION ALTITUDE 5000
			THR ELEVATION 26	
			BEARINGS ARE MAGNETIC	



Changes : New Chart.

RECOMMENDED PROFILE LPV - VERTICAL PATH ANGLE 3.5° (LNAV 6.1%), 372FT/NM			
NM to RW10	3	2	1
ALT (HGT)	1180(1154)	810(784)	440(414)
TCH 40			



Aircraft Category	A	B
OCA (OCH)	550 (524)	550 (524)
LPV	526 (500)	526 (500)
VM(C) OCA (OCH AAL)	550 (524)	630 (604)

NOTES.

- Caution: Procedure lies close to Doncaster and Leeds CTA/CTR. Aircraft not in receipt of a zone transit clearance must remain clear.
- Caution: Proximity of Leeds East Airport, 3NM to the north.
- Max speed 180KIAS.
- Joins direct to CJ10I are not permitted.
- To commence another approach following a missed approach, recommence at EMBIT.
- Pilots are to ensure Minimum Sector Altitude is adhered to following a missed approach and routing to diversion aerodrome.

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DRAFT D

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5.7 VFR chart 1:500,000 scale view Runway 10 approach

Northern joining point (Initial Approach Fix) approach fix. Altitude 2900 ft or above.

Final approach fix at altitude 1500 ft

Southern joining point (Initial Approach Fix) Aircraft joining from the south will remain below Leeds Bradford CTA



Runway 10

Missed approach path (dashed line) turns to the south to avoid Leeds East and then routes to the northern IAF, such that aircraft return to an MSA compliant exit from the procedure should they wish to divert elsewhere.

5.8 Ordnance Survey view Runway 10 approach



6 Safety management

The safety management of the IAPs uses the framework provided by CAP 1122, as was current in 2016. The detail of this is subject to a separate and detailed safety case that will also be reviewed by the CAA as part of the CAP 725 ACP approval process.

6.1 Lack of instrument runway

ICAO sets down international standards for the areas around runways which must be free from obstacles or objects that might pose a hazard to aircraft. For runways to which an IAP is established these are more stringent and are known as the 'instrument runway' standards. Runways without an IAP are normally designed to lesser 'non-instrument' (formerly 'visual') standards.

The ICAO definition of a 'non-instrument runway' also includes runways to which an *'instrument approach procedure to a point beyond which the approach may continue in visual meteorological conditions'* is established. The IAPs intended for Sherburn will be published under this definition. CAP 1122 sets out the framework and conditions for approval under these circumstances in the UK.

6.2 Air traffic management

Introduction of the IAP requires an overall assessment of the impact on the surrounding airspace and how aircraft flying the procedure would integrate with it. The following is a summary based on the safety case.

The primary challenge was operating without approach control, which Sherburn advocated could be achieved with an acceptable level of safety with PPR (prior permission required) and arrival slot allocation. Safety was further reinforced by negotiating Letters of Agreement (LoA) with local ATC units. These LoAs will provide that:

- Depending on the arrival directions/runways in use, aircraft will contact either Leeds Bradford or Doncaster Sheffield ATC and request an air traffic service outside of controlled airspace. The provision of this service will be subject to ATC capacity;
- When ATC workload permits, provision of a traffic or deconfliction service will provide mitigation against conflict with non-participating traffic that may be passing in the vicinity of the IAP; and
- If arriving aircraft wish to transit controlled airspace prior to joining the approach at Sherburn, Leeds or Doncaster ATC will facilitate this if operationally possible.

An ATC transponder code of 5077 has also been established that aircraft must use when intending to fly the IAP.

Conflict between visual circuit traffic at Sherburn and that approaching on the IAP was also considered as an issue since only an A/GCS is provided within the ATZ. This will primarily be managed by:

- The IAP only being available for IFR use when the cloud base at Sherburn is at or below 1200 ft AGL; and
- When the IAP is used under VFR (for training purposes) there must be an SAC approved instructor or safety pilot onboard to maintain an effective visual lookout.

6.3 Ongoing review

The utilisation rate will be monitored. Safety issues identified will be assessed as soon as possible by SAC, in accordance with the SAC SMS. The operational experience of the IAP will be formally reviewed after one month, three months, six months of implementation and annually thereafter. The Chairman of SAC will be responsible for ensuring this takes place and presenting the findings to the Board of Directors and the Head of Training. The Board will sanction any changes in response to any safety or environmental issues identified.

The review will include:

- 1) Review the log of RNP approach movements (the issue of PPR numbers);
- 2) Study any pilot reports;
- 3) Study any incident reports;
- 4) Study the number, type, and location of noise complaints;
- 5) Evaluate any desirable changes in the approach and missed approach paths;
- 6) Review the overall environmental impact; and
- 7) Produce a review document for consideration.

Any noise or impacts that do transpire can be discussed with local communities via the existing channels and any relevant changes to procedures considered.

7 Local Airspace Engagement

The design of the IAPs is entirely within class G airspace. However, there were several local airspace stakeholders who would potentially be impacted by the introduction of the IAPs. These stakeholders were identified and engaged with from 2016 onwards.

Due to the small scale of the envisaged operations, it was agreed with the CAA in November 2016 that full public consultation on the proposals would not be proportionate. SAC nonetheless engaged with all relevant local stakeholders to discuss the plans. In some cases, this involved multiple meetings to discuss local airspace arrangements. All arrangements will be subject to LoAs where appropriate.

The following is a summary of the airspace stakeholders identified by Sherburn, what engagement took place and what changes or arrangements have been agreed as a result. This includes recent engagement in September 2021.

Most engagement took place via email, with teleconferences, online meetings and face to face meetings being held as required with different stakeholders. Records of engagement have been kept should the CAA wish to inspect them.

Where LoAs have been established with stakeholders, these will also be submitted to the CAA with the ACP application for the IAP.

7.1 Leeds Bradford Airport (LBA).

Leeds Bradford Airport is to the west of Sherburn and aircraft approaching from the west will transit close to LBA airspace. Discussions involved layout of the procedures and the likely trajectory of arriving aircraft that may wish to receive an air traffic service. During the

development of the IAP safety case it was agreed that an LoA would be established between Sherburn and LBA.

7.2 Doncaster Sheffield Airport (DSA)

Doncaster Sheffield Airport is to the southeast of Sherburn and aircraft arriving from the south will transit close to DSA airport. The discussions with DSA were similar to those with LBA. The circumstances (for example depending on direction of arrival and runway in use) in which an aircraft should contact DSA (rather than LBA) will be set out by LoA. In 2016 DSA raised some concerns about the proximity of the southern joining procedure to RW28 and the northwest area of the DSA CTA. These concerns have been mitigated by a minor redesign of the southern join and guidance in the pilot briefing for the IAP. Once the IAP has been finalised, the LoA will be updated.

7.3 Leeds East Airport (LEA)

Leeds East (formerly RAF Church Fenton) lies to the north of Sherburn by several miles. The ATZs of the two aerodromes abut. The interaction of IAPs at LEA with those planned at Sherburn was a major consideration. The planned IAPs at LEA overlap with those at Sherburn. The management at SAC and LEA worked closely over several years to resolve the issue of coordination. Procedures and an LoA to avoid concurrent use of the IAPs have been established for when IAPs are operational at both Sherburn and LEA.

7.4 Brighton aerodrome

Brighton aerodrome lies to the northeast of Sherburn. Originally there was to be a joining point for RW28 to the northeast of Sherburn, catering for aircraft coming from that direction. This was approximately 2 NM southeast of Brighton. SAC approached Brighton management in 2018 to discuss this. In 2019 SAC understood to have agreed in principle an LoA with Brighton covering any coordination requirements.

In January 2020 Brighton communicated to SAC that they no longer supported the IAP and the arrangements agreed with SAC. Brighton requested several amendments to the procedures. Not all these requests were possible (mainly due to instrument procedure design limitations) but in response SAC removed the northeast joining point and instead added a join on the extended centreline for RW28.

Sherburn also conducted a risk assessment on conflict with Brighton and added it to the local airspace hazards to be avoided, which are identified in the pilot briefing. The latest version of the procedures has been communicated to Brighton and SAC is satisfied that the final procedure designs adequately take account of activities at Brighton, without the need for an LoA.

7.5 Burn Gliding Club

The Burn glider site lies just to the south of the final approach track for runway 28, about 5 NM from the RW28 threshold. Aircraft approaching RW28 will therefore pass in proximity to Burn. Burn Gliding Club was first approached in 2016 for comment and discussion around a coordination agreement with SAC. Burn did raise concerns about the proximity of the final approach to RW28, but it was not possible to materially change the approach track due to design limitations and the CAP 1122 brief that the procedures be as simple as possible.

After multiple versions of a LoA SAC believed that an agreement with Burn could be reached, but at this time it has not been possible to finalise this.

After conducting a risk assessment, SAC is confident the IAP can proceed without a formal agreement with Burn – mainly on the basis that when the weather conditions are such that the IAP will be used, gliding activities are likely to be limited.

A large proportion of VFR traffic inbound to Sherburn already passes close to Burn, largely without issue. Burn is generally well known as a potential hazard to pilots operating at Sherburn and SAC does not believe the introduction of the IAP significantly impacts Burn's operation or increases the risk of mid-air collision.

It will be emphasised in the pilot brief that Burn is a potential hazard and that pilots are responsible for see and avoid when in VMC.

Whether or not an LoA is established with Burn, SAC will notify Burn of any planned RNP IAP activity in advance and the Sherburn A/G operator will make broadcasts on the glider radio frequency to indicate when an aircraft is commencing the RNP IAP.

SAC will produce a laminated A5 format depiction of the RNP procedures on an aeronautical chart. These will be distributed to local stakeholders for awareness of the procedure.

7.6 Garforth

Garforth is a small landing site about 5 NM west of Sherburn, marked on the VFR chart as a helicopter site. Garforth is underneath the approach path for RW10. Activity at Garforth is quite limited, but SAC have established a coordination LoA.

7.7 Emergency Service Helicopters

Some NPAS and Air Ambulance activity takes place in the Leeds / Sherburn area, so LoAs were signed with both local NPAS and Air Ambulance units to ensure the operating pilots were aware of the IAP layout.

7.8 Other aviation stakeholders

Other stakeholders further afield were contacted for comment, including Full Sutton airfield, the landing site at Walton Wood and the glider clubs at York, Pocklington and Sutton Bank. The glider sites were more the focus of the consultation on IAPs at Leeds East airport, but the presence of the Sherburn IAPs was also noted in this context. No direct impacts were identified, or action required by SAC.

8 Non-aviation engagement

Local councillors and community representatives have historically met with Sherburn's community liaison representative on a biannual basis to discuss any issues regarding relations between SAC and the local community. During Covid, this has been more on a reactive basis – with meetings organised to discuss specific issues if required.

For the purposes of engagement with non-aviation stakeholders, it was considered sufficient to keep engagement limited to the liaison group. A specific meeting was held on 17th January 2017

in which SAC made a short presentation to representatives of local authorities included in the normal liaison group. All members of the group who were not present were sent the presentation. The 2021 changes are not considered to materially affect non-aviation stakeholders.

9 Environmental impacts

9.1 Noise

Like most aerodromes of any significant activity, Sherburn does attract noise complaints. These are mainly generated by traffic repeatedly flying around the aerodrome traffic circuit for training purposes. This is a long-standing issue that SAC manages as far as possible and is not considered relevant to the proposed IAPs. Occasionally aircraft conducting aerobatics in the surrounding areas (which may not originate from Sherburn) attract complaints, but other than that it is very rare for aircraft outside the ATZ to attract any noise complaints.

Given that the likely increase in movements due to the IAP being very small, SAC does not believe that any significant change to noise impact of the aerodrome will occur.

There is not likely to be any significant change in the types of aircraft operating at Sherburn as a result of in the IAPs. The relatively short length of runway 10/28 (around 830 m) limits the types that can safely use Sherburn to typical light aircraft models.

For reference, noise values for the approach phase (taken from the FAA Advisory Circular April 2002 AC No 36-3H) of typical aircraft that use Sherburn are listed below. They are approximate and derived from when the aircraft is around 1 NM from landing (therefore at around 350 ft). At this distance/height, there would be no difference in noise levels from the IAP compared to a visual approach. When flying the track of the IAP, aircraft would be much higher than this – above 1500 ft AGL until approximately 4 NM prior to the runway and therefore a lot quieter from the ground.

Aircraft		Noise
Piper PA28		61 dB
Cessna 425		75 dB

Currently aircraft approach from all directions with a concentration over the ATZ and around 1 mile around the ATZ. The main difference between IAPs and visual approaches into Sherburn is that aircraft will be established on the final approach track further away from the runway, rather than flying directly to the immediate vicinity of the aerodrome before descending more rapidly for landing.

While this could expose new communities to noise, the low utilisation rate and the general lack of residential areas beneath the approach tracks will limit this. Those currently most affected by Sherburn's flying will not experience any increase in impact since within 2 NM or so of the runway (when aircraft are at 1000 ft AGL or less) the tracks followed by existing visual arrivals and that on the IAP will be similar.

The positions of the final approach tracks could not be altered from the standard design (ie aligned with the runways) due to safety regulatory requirements, however the paths of the initial joins and the missed approach were adjusted so as to avoid built up areas as much as possible.

9.1.1 Runway 28

Due to the prevailing wind, most approaches flown will be to runway 28.

Efforts were made to ensure the IAP tracks to 28 did not unnecessarily overfly residential areas. The potential impacts below 1500 ft AGL were considered most significant, although much below 1000 ft AGL the difference between the tracks adopted by existing visual and instrument traffic is not significant.

The overflight of Brayton (just to the south of Selby) and Thorpe Willoughby on the final approach track was considered undesirable during the design phase, however avoiding them would have led to a 4° offset to the south, thereby raising a conflict with the glider site at Burn. PANS-OPS also advises against runway alignment offsets purely for noise abatement reasons.

It was identified that the initial missed approach leg will pass over the southern tip of the village beyond runway 28. The impact of this will be minimal – missed approaches will be rare. Missed approaches flown under VFR for training purposes will visually avoid the village before regaining the missed approach path.

9.1.2 Runway 10

Efforts were made to ensure the IAP tracks to runway 10 did not unnecessarily overfly residential areas. Potential impacts below 1500 ft AGL were considered most significant, although below 1000 ft AGL there is little difference in track between instrument traffic and existing visual traffic. The final approach track on RW10 does not overfly significant residential areas, the only exception being the southern tip of Sherburn village just prior to the runway. SAC typically does not receive noise complaints relating to the final approach to RW10, we do not believe introduction of the IAP will increase the noise impact of Sherburn operations, due to the very low number of additional movements.

The missed approach tracks were adjusted for the best possible compromise between airspace, obstacle constraints and minimising over flight of residential areas.

9.2 Other environmental impacts

CAA guidance also requires any impacts on National Parks, Areas of Outstanding National Beauty (AONB), fuel burn/CO₂, local air quality, tranquillity or visual intrusion are considered.

Sherburn does not reside in an AoONB or National Park. Impacts on local air quality or CO₂ emissions are likely to be negligible due to the low utilisation rate and that for the most part aircraft will be encouraged to operate using the normal visual joining procedures when conditions allow. There are no Air Quality Management areas overflown by the IAP.

On the basis that the IAP may allow some aircraft to land that otherwise would not and that the overall distance flown by an aircraft on an IAP tends to be slightly greater compared to a visual approach a modest increase in CO₂ emissions and fuel burn could be anticipated, although this should be considered against the fact that many of these flights would otherwise have landed elsewhere (potentially further away from origin) rather than not take place at all.

It is difficult to predict the exact impact, but the taking the estimated additional distance that an aircraft might fly on an IAP compared to a visual approach as around 7 NM (based on the increased distance the aircraft will be aligned on the final approach and having to fly the T-bar shape from the initial approach fix) and using typical speed and fuel burn figures, some approximate comparisons have been generated below.

The CO₂ burn figures are based on 2.2 kgs of CO₂ per litre of fuel consumed for aircraft consuming aviation gasoline (AVGAS) and 2.5 kgs for aircraft using kerosene², such as the Cessna 425. Most aircraft at Sherburn use AVGAS.

Aircraft	Fuel burn (VFR)	Fuel burn (IAP)	CO ₂ (visual)	CO ₂ (IAP)
Piper PA28	2.5 ltrs	3.2 ltrs	5.5 kgs	7kgs
Cessna 425	25 ltrs	36 ltrs	62.5 kgs	90 kgs

It is emphasised that these figures are for comparison purposes – it is not the intention that aircraft currently flying shorter visual approaches will instead use the IAP with the associated potential for greater fuel burn.

SAC does not believe there to be any tranquillity or visual intrusion impact associated with introducing the IAP.

² The CO₂ burn figures are metric conversions of those published by the US Energy Information Administration

Appendix 1 – List of engagement stakeholders

Aviation
Leeds Bradford Airport
Doncaster Sheffield Airport
Burn Gliding Club
Garforth
Brighton Airfield
Leeds East Airport
Local NPAS and Air Ambulance helicopter operators

Local community (via local liaison group)
Sherburn Parish Council (attended 2017 presentation)
South Milford Parish Council (attended 2017 presentation)
Monk Frystone Parish Council
Selby District Council
Biggin Parish Council
East Yorkshire County Council
North Yorkshire County Council

Appendix 2 – Abbreviations and Acronyms

1. A/GCS – Air Ground Communication Service (often seen at A/G)
2. ACP – Airspace Change Proposal
3. AGL – Above Ground Level
4. AIP –Aeronautical Information Publication
5. AoONB – Area of Outstanding Natural Beauty
6. ATC – Air traffic control
7. ATS – Air Traffic Service
8. ATZ –Air Traffic Zone
9. CAA – Civil Aviation Authority
10. CAP1122 – CAA Publication 1122
11. CFI – Chief Flying Instructor
12. CFIT – Controlled Flight Into Terrain
13. CO₂ – Carbon Dioxide
14. dB – decibels (level of sound measurement)
15. DSA – Doncaster Sheffield Airport
16. EGNOS – European Geostationary Navigation Overlay Service
17. FAF – Final Approach Fix
18. GA -- General Aviation
19. GNSS –Global Navigation Satellite System
20. IAF – Initial Approach Fix
21. IAP – Instrument Approach Procedure
22. ICAO – International Civil Aviation Organisation
23. IF – Intermediate Fix
24. IFR – Instrument Flight Rules
25. IMC – Instrument Meteorological Conditions
26. LBA – Leeds Bradford Airport
27. LNAV – Localiser performance without vertical guidance
28. LOC loss of control
29. LPV – Localiser Performance with Vertical Guidance
30. MAC Mid-Air collision
31. MAP – Missed Approach Proceedure
32. MTOW – Maximum Take Off Weight
33. NATMAC - National Air Traffic Advisory Committee
34. NM – nautical mile
35. PANS-OPS – Procedures for Air Navigation Services - Operations
36. PPR – Prior Permission Required
37. RNAV – aRea NAVigation
38. SAC – Sherburn Aero Club
39. TAA – terminal arrival altitude
40. VFR – Visual Flight Rule

Appendix 3 – CAA questions in November 2021 regarding the September 2021 submission

Reference (September '21 document)	Questions/Issues	Sherburn Response
Page 3	Para 1 - Accepted that there are 'no major changes' however, this document is what will be used for the regulatory assessment.	Noted, Sherburn Aero Club believes the document accurately reflects the current proposal.
Page 3	Para 1.1 - IAWP2 was moved because it was 'felt' to be more optimal. This needs further justification, why was it moved, reference later paragraph?	A fuller explanation has been added to para 1.1, it is essentially to reduce the infringement risk of the Doncaster CTA.
Page 3	Para 1.1 - Northern approach fix removed due to proximity of Brighton; was this due to stakeholder feed-back, see para 7.4?	Text added to para 1.1 confirming that it was a result of stakeholder feedback.
Page 3	Para 1.2 - What is a sector safe location?	Wording clarified in para 1.2 – it refers to the missed approach terminating at a terrain safe location.
Page 4, Page 8	Para 2 - Inconsistent messaging on when procedures will be used; poor weather AND no visual flying in aerodrome traffic pattern; not significantly increase movements; utilisation 2/3 a day when weather conditions are poor averaging one per day (is this over a year?) Para 5 - only for use when required due to the weather, most approaches to RWY 28. Slot sharing with LEA, 'not more than 10 per day'?	Wording clarified.

Page 4	Para 2 - What is focused consultation, was this engagement?	Word 'consultation' replaced with 'engagement'.
Page 6	35,000 movements annually; where is this figure taken from?	Internal Sherburn records (pre-Covid).
Page 6	Para 4 - Is there something beyond the ordinary that makes Sherburn vulnerable to disruption by weather conditions, or this just due to the 'British weather'?	Not as such, but weather in that area of UK can be marginally worse than elsewhere.
Page 7	Are the operational advantages, operational resilience and safety?	Yes.
Page 7	What is meant by limited opportunities to fly the trajectory of the procedure in VMC?	This is referring to limited training purposes. The wording has been clarified to describe what Sherburn is proposing more accurately.
Page 7	What is the actual procedure for aircraft diverting?	There is no procedure as such, it would be at pilot discretion, it is more about the wider philosophy of how the IAP will be used.
Page 8	Why is the use of the MAP Path envisaged to be very limited?	Because the vast majority of approaches result in a landing rather than a missed approach. Exact figures for GA are not available, but a typical missed approach rate would be in excess of 1 per 100 approaches based on typical pilot experience.
Page 8	Burn is a potential hazard; the risks will be addressed as part of the operational procedures for the IAP; IFP Regulator to check.	Noted.
Page 10	Procedure will still go 100ft below Doncaster CTA; is this considered safe?	Yes.

Page 12	Reference to minimising environmental impacts and environmental issues; what are the environmental impacts/issues?	Some text removed. We don't think there was anything specific environmentally, other than that when there was a choice of avoiding a built-up area vs. flying over one, the design aims to avoid overflight.
Page 14	Assertion that aircraft will remain below LBA CTA, yet joining level is minimum 2000ft; is this correct displayed?	Yes, pilots will have to remain below LBA CTA, but this is clearly stated in note 1 of the procedure.
Page 16	Managing aircraft on the IAP joining when there is VMC traffic in the ATZ; 1200 ft AGL (levels used are not consistent); See Pilot brief Para 17 and 34; use of 'not normally' and 'strongly encouraged'; language should be unambiguous.	AGL is used throughout ACP document. We will review the pilot brief.
Page 17	Para 6.3 - The monitoring of the utilisation rate; what will be the threshold at which it is deemed their may be an issue? Any further changes to procedures could require another ACP?	There is no particular set threshold – it is more to put any issues in context of the utilisation rate. Any future changes would be judged against CAA criteria as to whether they required another ACP. We would not want to speculate at this stage as to what they might be or why they might be required.
Page 18	Para 7.4 - Was the only outcome of the risk assessment conducted, that Brighton be added to the local airspace hazards to be avoided? If there is no LoA with Brighton, was another risk assessment done?	We also removed the northern initial approach fix (join). We consider the risk assessment to be adequate – the statement in the ACP document is more that we conducted one.
Page 19	Para 7.5 - No LoA with Burn; does not appear to comply with overall safety case; CAA may be accepting of best endeavours; will you sign up unilaterally not to use the procedure when Burn are operational as you allude too?	We make it clear in the safety case that an LoA with Burn is not an essential safety requirement. In the absence of an LoA SAC would still notify Burn of any planned IAP activity and the SAC A/G operator would make announcements on the glider frequency when IAP traffic was inbound.

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		Aircraft flying the procedure under IFR, that may become VMC prior to passing Burn will be responsible for avoiding any glider activity they may encounter in accordance with the normal rules of the air.
Page 20	Environmental Impacts, no mention of training flights?	The impact of training flights flying the procedure in VMC is not going to be significant.
Page 21	What efforts were made to avoid overflight of residential areas?	The initial joins and missed approach were moved away from built up areas as much as reasonably possible, although the final approach track is where it is required by regulation – aligned with the runway.
Page 22	Where has the figure of 2.7kgs of CO2 per litre of fuel come from; is this a standard figure?	Yes, they are a standard figure (not specific to the aircraft models mentioned) for CO ₂ produced by consuming a litre of the relevant fuel. We have updated them with figures from the US Energy Information Administration (converted in metric).

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